

## BIOTERRORISM- AGENTS & ANTIDOTES

Agent <sup>1</sup>	Treatment (symptomatic)	Post-exposure Prophylaxis (prevention)	Vaccination <sup>2</sup>	Comments	Local Availability of Meds <sup>3</sup>	SNS Availability of Meds <sup>4</sup>
<b>Anthrax</b> ( <i>Bacillus anthracis</i> )	60 days (IV initially, then PO)  <b>Adults:</b> Cipro* 400mg IV q12h or Levaquin* 500mg IV daily or Doxycycline* 200mg IV, then 100mg IV q12h or Tequin 400mg IV daily <b>plus 1-2 additional:</b> ampicillin, chlor- amphenicol, clindamycin, linezolid, imipenem/meropenem, macrolide, penicillin*, rifampin, vanco  <b>Children*:</b> same dosing as post-exposure  Supportive therapy (aggressive and early) for shock, fluid volume deficit, and adequacy of airway may be indicated	60 days (at least, then ± vaccine)  <b>Adults:</b> Cipro* 500mg PO BID or Levaquin* 500mg PO daily or Doxycycline* 100mg PO BID or Tequin 400mg PO daily  <b>Children*:</b> Cipro* 10-15mg/kg PO q12h or Doxycycline*: >8 yrs and >45 kg: 100mg PO BID >8 yrs and ≤45 kg: 2.2.mg/kg PO BID ≤8 yrs: 2.2 mg/kg PO BID	*Vaccination schedule: Biothrax 0.5ml SQ after exposure then at 2, 4 wk (then 6, 12, 18 mo, and then annual booster, if necessary, for prolonged protection)  Vaccine is not readily available to general public and mass vaccination is not practical.	Pregnancy and immuno- compromised have same recommendations.  Cutaneous anthrax treatment: ciprofloxacin or doxycycline for 60 days.		Cipro IV, PO Doxy IV, PO Amoxicillin PO Clindamycin IV Penicillin GK-IV Rifampin-IV Vancomycin-IV
<b>Botulinum toxins</b> ( <i>clostridium botulinum</i> )	Trivalent equine antitoxin* (serotypes A,B,E) or Heptavalent antitoxin (serotypes A,B,C,D,E) 1 10ml vial (diluted) slow IV over 10 min  <b>Children (&lt; 1yrs):</b> Bivalent human antitoxin (BabyBIG, serotypes A, B) 1 ml/kg (50mg) slow IV  Doxycycline 100mg q12h PO x 4-6 wk plus streptomycin 1g IM BID or gentamicin 1.5mg/kg q8h IV/IM for the first 2-3 wks or Doxycycline 100mg q12h PO plus rifampin 600-900mg/day PO x 6 wk	Observe/Monitor for signs and symptoms  Post-exposure with heptavalent antitoxin effective in animal studies (no human data; only for extraordinary circumstances)	Pentavalent toxoid vaccine (A, B, C, D, E) for high risk individuals (pre-exposure prophylaxis)	Risk of anaphylaxis (horse serum)-skin test before equine antitoxin admin.; may also cause serum sickness		Bivalent (AB); Monovalent (E); Heptavalent; Monovalent (A)  (No Baby BIG in SNS)
<b>Brucellosis</b> ( <i>brucella sp.</i> )	<b>Plague pneumonia:</b> Streptomycin 15mg/kg IM q12h or Gentamicin 1.7mg/kg q8h (or 5mg/kg once daily) IV/IM or Cipro, Levaquin or Tequin x 10 days or Doxycycline 200mg IV once, then 100mg IV q12h x 10-14 days  <b>Plague meningitis:</b> chloramphenicol IV 25mg/kg load, then 15mg/kg q6h (adults and peds)	Doxycycline plus rifampin x 3-6 weeks	N/A	N/A		Doxy IV, PO Gent IV
<b>Plague</b> ( <i>Yersinia pestis</i> )		Cipro 500mg PO BID or Levaquin 500mg PO daily or Tequin 400mg PO daily or Doxycycline 100mg PO BID x 7 days  Alternatives: Tetraacycline 500mg PO q6h Chloramphenicol 25mg/kg PO q6h x 7 days	*Vaccination (Greer inactivated vaccine, not readily available) 1.0ml, then 0.2 ml at 1-3 and 3-6 mo; boosters 12, 18 mo, and yearly (at risk)  Vaccination may not be effective for pneumonic Plague.	N/A		Cipro IV, PO Doxy IV, PO Gent IV

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<b>Q fever</b> ( <i>coxiella burnetii</i> )	Doxycycline 100mg PO q12h x ≥ 14 days or Tetracycline 500mg PO q6h x ≥ 14 days	Start 8-12 days after exposure x 5 days with doxycycline, tetracycline or fluoroquinolone	N/A	Acute Q fever can lead to chronic Q fever (endocarditis, hepatitis)		Doxy IV, PO
<b>Small pox</b> (Variola major)	Cidofovir Ribavirin (effective in vitro)  Supportive care!	Commence mass vaccination Vaccinia immune globulin (VIG) 2 ml/kg (100mg/kg) IV (within 3 days of exposure, but best within 24 hrs.)  Limited info with VIG ± vaccine for post-exposure.	Review contraindications and precautions prior to vaccination.  VIG is warranted for certain vaccination reactions (check www.cdc.gov)	VIGIV infusion: 1 ml/kg/hr for 30 min. then 2 ml/kg/hr for 30 min then 3 ml/kg/hr for remainder. VIGIV not studied in pediatrics or elderly.		Vaccine- supply adequate;  VIG-considered adequate supply to support vaccination campaign
<b>Toxins</b> (Staphylococcal enterotoxin B, ricin)	Ventilatory support and supportive care	N/A	N/A	Vomiting and diarrhea may occur if toxin ingested		N/A
<b>Tularemia</b> (Francisella tularensis)	Streptomycin* 1 gm q12h IM or Gentamicin 5mg/kg daily IV/IM or Cipro, Levaquin or Tequin x 10-14 days or Doxycycline 100mg q12h IV or Chloramphenicol 15mg/kg q6h IV x 14-21 days	Doxycycline 100mg PO BID Cipro 500mg PO BID or Levaquin 500mg PO daily or Tequin 400mg PO daily x 14 days	N/A	N/A		Cipro IV, PO Doxy IV, PO Gent IV
<b>Viral encephalitides†</b> (alpha viruses)	Supportive therapy, analgesics, anticonvulsants prn	N/A	N/A	N/A		N/A
<b>Viral hemorrhagic fevers*</b> (filoviruses, arenaviruses)	Ribavirin (CCHF/arenaviruses) 30mg/kg IV initially then, 15mg/kg IV q6h x 4 days then, 7.5mg/kg IV q8h x 6 days	N/A	Yellow Fever vaccine only VHF vaccine available.	N/A		N/A

- Category A and B agents. All inclusive except Psittacosis (*Chlamydia psittaci*) and Typhus fever (*rickettsia prowazekii*)
- Currently no vaccines commercially available to the general public.
- Availability of medications may change in future.
- SNS: strategic national stockpile program (CDC)

\* FDA approved for indication.

• Pediatric antibiotic dosing for other agents (i.e. tularemia, plague): same Cipro and doxycycline dosing as treatment and post-exposure prophylaxis for anthrax, except gentamicin- for children it should be dosed 2.5mg/kg q8h IV/IM, streptomycin 15 mg/kg IM q12h

† VEE- Venezuelan equine encephalitis; EEE- Eastern equine encephalitis; WEE- Western equine encephalitis;

\* Hemorrhagic viruses: Lassa Fever, Rift Valley Fever, Hantavirus, CCHF- Congo-Crimean hemorrhagic fever

### References

USAMRIID Medical Management of Biological Casualties Handbook. Fifth edition. August 2004. (<http://www.usamriid.army.mil/education/bluebook.htm>)  
 FDA CDER. (<http://www.accessdata.fda.gov/scripts/cder/drugsatfda/>)  
 CDC. ([www.bt.cdc.gov](http://www.bt.cdc.gov))